



Hood Canal Bridge News

Retrofit and East-Half Replacement Project

Fall 2003

Crews installing graving dock's drainage system

It started with a few shells exposed by a backhoe scoop, something not unexpected during an excavation along a Northwest shoreline. But those shells proved the first clue that this was not going to be a typical construction project.

Following that Aug. 26 Saturday afternoon, archeologists from the Washington State Department of Transportation and the Lower Elwha Klallam Tribe discovered archeological items at the 22.5-acre site, temporarily halting construction work.

WSDOT recently began installation of a stormwater treatment system at the site. The treatment system will allow WSDOT and the contractor, Kiewit-General of Poulsbo, to move stormwater away from archeological

areas, while also separating site run-off from the run-off leaving nearby properties.

The work entails installing a system of treatment and retention ponds, connected by drainage lines. This requires ditching and trenching work. Both the Tribe and WSDOT will have archeologists on site monitoring the work.

The Tribe and WSDOT, in cooperation with the Federal Highway Administration, the state Office of Archaeology and Historic Preservation and U.S. Army Corps of Engineers, are all working together to advance the construction of the graving dock, while protecting the human remains and cultural materials unearthed at the site.

Consultation continues on the specific

details of a "Memorandum of Agreement," a formal agreement between the entities and the next step in restarting work required by federal law.

The Klallam Nation lived along the shores of the Strait of Juan de Fuca for thousands of years before the waterway gained its name by Spanish explorers in the late 1700s.

The Lower Elwha Klallam Tribe lived at what is now the site for the graving dock project until the 1930s when they were removed to their current reservation eight miles away.

Previous industrial development has disturbed the land and the Tribe's cultural and

*Please see more **DRAINAGE** on page 3*

Fish wranglers at work on HCB

In what could be precedent-setting research to protect wildlife in aquatic construction areas, Washington State Department of Transportation will be doing a roundup.

But this type of roundup doesn't have anything to do with horses or cowboys. Rather, WSDOT and environmental contractors will be protecting marbled murrelets, a bird on the endangered species list.

In early November, Hood Canal Bridge contractor Kiewit General began trestle construction phase of the \$204 million contract to replace the east half and repair the west half of the 42-year-old Hood Canal Bridge.

This trestle construction makes waves, specifically underwater sound, or pressure waves, from the pile driving. During pile driving operations two boats from Battelle Marine Sciences Lab will be measuring underwater sound impacts, while an additional crew from Entranco and Hamer Environmental will be charged with wrangling the marble murrelets.

Battelle will also be monitoring light under the new work trestle.

Once researchers compile the data, WSDOT will publish their findings on ways to reduce damage to aquatic organisms.

*Please see more **WRANGLERS** on page 3*

Anchor Cables: Keeping the HCB safely in harbor

While much of the publicity has focused on rehabilitating the floating portion of the Hood Canal Bridge, the three-inch cables that stop the bridge from floating into the Pacific Ocean recently received much-needed attention.

Floating bridges function like a ship. The roadway is built upon a series of concrete pontoons that float, despite their enormous size and weight.

The Hood Canal Bridge's series of pontoons are attached or 'anchored' to land by 685- to 1,875-ton anchors. Attached to these anchors are individual wire strands that intertwine, twist and wrap to become three-inch diameter anchor cables designed to hold 538 tons.

"These cables are 'double-anchored,' like a bridle on a horse," explained WSDOT bridge engineer Patrick Clarke.

"We start at the pontoon's anchor gallery with a spelter socket, go out through the side of the pontoon at a 14 1/2-degree angle, reach the anchor, go around and then back up."

In layman's terms, these cables stop the Hood Canal Bridge from floating away.

The Washington State Department of



A worker uncoils a portion of the cable that will become a portion of the Hood Canal Bridge's anchor cable. The WSDOT completed a \$600,000 project this fall to replace close to 5,500 feet of anchor cable.

Transportation completed a \$600,000 project this fall to replace close to 5,500 feet of anchor cable. During the entire bridge rehabilitation process, WSDOT will replace nearly 13 miles of cable.

Each year, the WSDOT sends in engineers, divers and underwater cameras to inspect the cables on each of the state's floating bridges. These studies look for corrosion, wire breakage and other signs of wear and tear.

*Please see more **CABLES** on page 3*

Ediz Hook

WSDOT restores land; local residents and natural creatures reap rewards

EDIZ HOOK - Locals and visitors alike now have another place to enjoy wildlife and recreation in the Port Angeles area.

The Washington State Department of Transportation recently completed a restoration project at Ediz Beach, adjacent to Sail and Paddle Park. Close to 1,000 feet of shoreline was cleaned and reseeded. WSDOT also restored an additional 500 feet of shoreline that the Port of Port Angeles will put in their 'bank' for future projects.

For many years, the Ediz Beach area was unsafe and inaccessible due to logs, pilings and other debris. WSDOT removed nearly 60 creosote-covered pilings, doing the work at low tide as to not disturb the harbor waters. The beach, which consisted largely of fill, was re-graded to its predevelopment lines, and covered with sand.

In addition, logs were placed on the beach at the high-tide level and the upland areas were seeded with a hand collected native dune grass mix. Also added were traffic logs, put in place to keep automobiles out of the



Photo at right was taken Sept. 29, while photo above was taken Oct. 12. WSDOT crews removed pilings, logs and other debris from the waterway area. Today, Ediz Beach provides a healthy, natural environment for native plants and animals and may encourage spawning sand lance.



Directions to Ediz Beach: take US 101 to Port Angeles, then go west on Front Street and Marine Drive past the Daishowa mill onto Ediz Hook. The beach is three quarters of a mile to the restoration site on your right.

Hydraulic Project Approval (HPA) issued by the Department of Fish and Wildlife as mitigation for use of shoreline access to the graving dock.

Part of the graving dock construction requires dredging a channel to connect the dock to the Port Angeles Harbor. The mitigation project had to be completed before Oct. 15 so as not to disturb the sand lance during its spawning period. Crews completed the project between Sept. 24 and Oct. 12.

Contact: David Garlington, (360) 457-2575.

beach area.

This restoration provides a healthy natural environment for native plants and animals and may also encourage the spawning of sand lance, a small fish and significant portion of the juvenile salmon's diet.

It was completed in accordance with a

On-line bridge and Olympic Peninsula resources:

Hood Canal Bridge Project

www.hoodcanalbridge.com

Jefferson Transit

www.jeffersontransit.com

Clallam Transit

www.clallamtransit.com

Kitsap Transit

www.kitsaptransit.org

General government information

www.access.wa.gov



The Hood Canal Bridge Fall 2003 Update is published by the Washington State Department of Transportation's Olympic Region.

For more project information, contact:

WSDOT Port Orchard Project Office
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Port Orchard, WA 98367-8192

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E-mail: orfeedback@wsdot.wa.gov

Additional project information is available on-line at

www.hoodcanalbridge.com.

Traffic information for the SR 104 Hood Canal Bridge is available by calling 1-800-419-9085. Weather and roadway conditions are available on-line at www.wsdot.wa.gov/traffic.

Cables

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Ron Lewis, project manager for the Hood Canal Bridge rehabilitation, described the cables' corrosion to something much smaller, but just as vital – a shoelace.

"As it becomes frayed, it can still do its job to a point," Lewis said. "But, eventually you will have some breakage."

It was the fraying of cables C-north and D-south that engineers felt needed attention.

Beginning from the western span, the cables are designated based on the pontoon they protect. Within each pontoon is an anchor gallery, where the cables' tension is monitored, and if needed, adjusted.

During the C-north and D-south replacement and throughout the entire rehabilitation process, engineers continue their fight against Mother Nature's corrosive person-

ality.

"Much of the corrosion is caused by a naturally-occurring current (electrolysis) from salt water movement," Clarke said. "We counteract the chemistry and physics corroding the cables by inducing a man-made current in the opposite direction."

This man-made, low-voltage current of cathodic protection (CP) occurs in the anchor galleries.

Each gallery consists of the components to complete CP, including a rectifier and anode connections. The entire system is like a battery with a cathode, anode and seawater as the electrolyte. The rectifier creates the potential in the system to make the electrons stay in the structure we want protected.

While not 100-percent foolproof, this significantly extends the life of the cables.

Wranglers

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"The Hood Canal Bridge's east approach is prime marbled murrelet habitat," said John Callahan, WSDOT project engineer. "These are seabirds on the endangered species list. Our wranglers will prevent the birds from getting too close to the pile-driving operation and being harmed."

Callahan said WSDOT may also gain vital measurement of shading caused by structures and its effect on migrating juvenile fish.

"Fish ocular nerves react differently than people," Callahan said. "We have a mechanical iris while fish use chemical methods which don't react as quickly."

"The fish perceive the shade as an obstacle and place themselves in greater predatory harm when trying to move into deeper water around the shadows," Callahan continued.

"The consultant will measure the shade as well as documenting our method of mitigating the shadows, such as painting the underside of the work trestle white or placing active lights."

The joint venture remains an example of how government agencies and private enterprise can work together to protect fish and wildlife and provide the most cost-effective options for state residents.

"The knowledge base regarding methods to reduce pile driving noise is sparse," Callahan said. "And, we are fortunate to have many other research opportunities spawned by the trestle work."

The Science Behind the Hood Canal Bridge

Spelter socket: wire rope socketing where molten zinc is used to attach a socket to a wire rope. Spelter in this case means "zinc."

Rectifier: an electrical device for changing alternating current to direct current.

Anodes: A positive charged electrode with a shortage of free electrons.

Cathodic Protection: A negative charged electrode or cathode. It has an abundance of free electrons.



Drainage

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ancestral grounds. The Tribe and WSDOT are committed to working together to appropriately and sensitively recover the human and cultural remains located on the site.

"We are pleased with the progress we have made," noted Transportation Secretary Doug MacDonald. "Completing the drainage work will help protect the property, and any archaeological materials that may be found from the winter rains. It is a crucial step forward for the project."

For more information on the SR 104 Hood Canal Bridge project, visit www.hoodcanalbridge.com.

Keep up on Hood Canal Bridge progress

Drop a line to the HCB Project Office either via E-mail at orfeedback@wsdot.wa.gov or by phone at (360) 874-3000.

We'll add your name to the project contact list.

You will receive a copy of the quarterly newsletter and project updates as they become available.

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*Project presentations
for clubs
and associations
available*

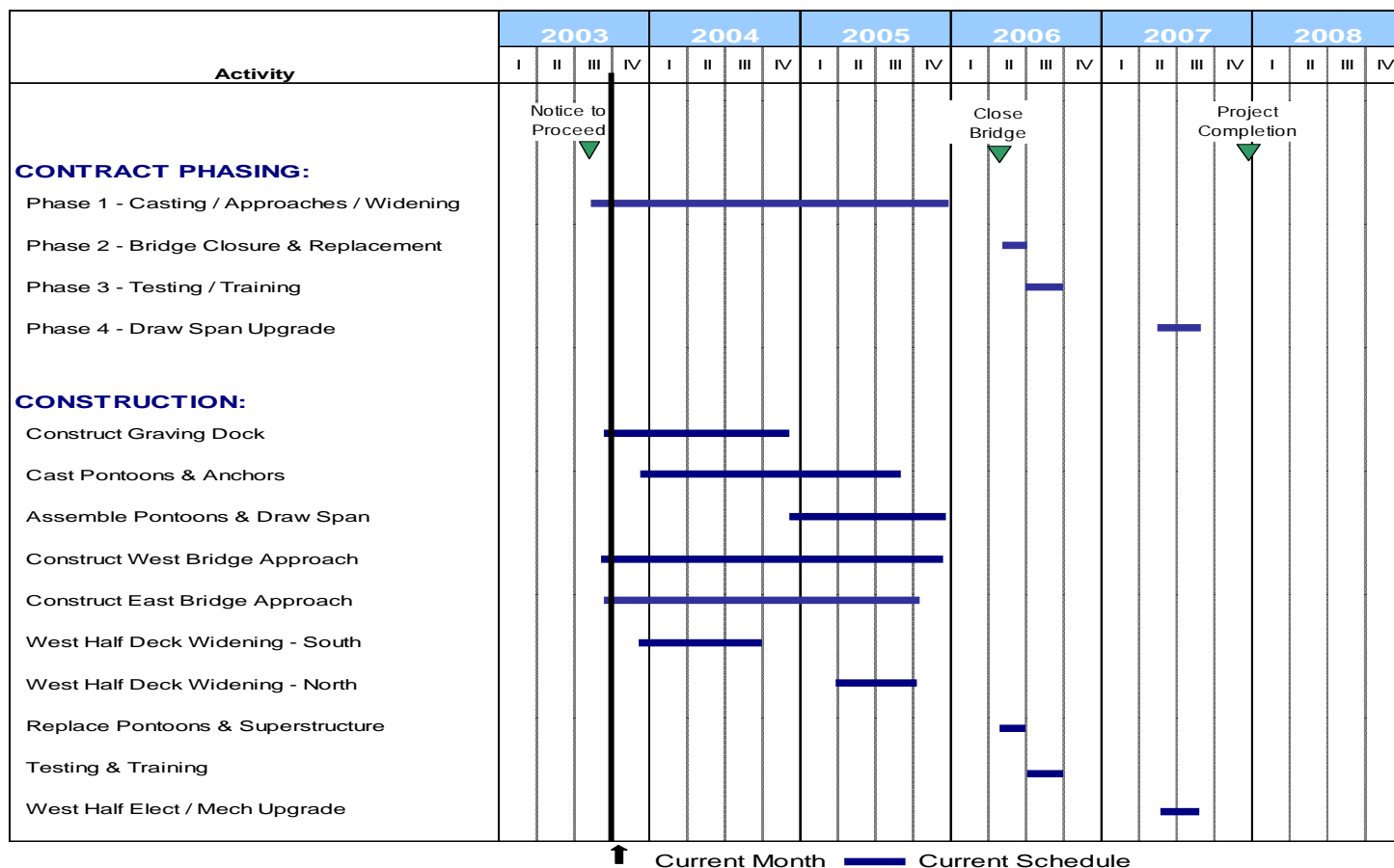


HCB Project Manager Ron Lewis speaks to a Port Ludlow homeowners association in October.

Want a project presentation for your club or organization? Contact the project communication team at (360) 357-2789.

The Hood Canal Bridge remains open during most phases of the 3-1/2 year construction project, but there will be an 8-week closure in May and June 2006.

For more information on the SR 104 Hood Canal Bridge visit, www.hoodcanalbridge.com.



Washington State Department of Transportation

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